Note on Espin's Object in Perseus, R.A. 4^h 26^m. Decl. +51°.
By C. D. Perrine.

(*Communicated by Rev. T. E. Espin.*)

I have examined this region on two nights, November 16 and 17, with the 12-inch equatorial, using a power of 85, and with the 6½-inch comet-seeker, using a power of 38. The conditions have been excellent for this work, the atmosphere being unusually transparent, and the seeing good.

I have been unable to see anything unusual about this region; there are fewer stars than in the immediate surroundings, which gives the impression of a darkening. There are some 13th and 14th magnitude stars in the area, however, and a very faint cluster, 3′ or 4′ in diameter, on the southern limit of the area. With a low power the latter has a slightly nebulous appearance. It is similar to other blank fields in the sky, but is not nearly so dark as some of the so-called "coal-sacks." I see no trace of nebulosity.

Lick Observatory: 1898 *November* 17.

The Great Sun-spot of September 1898.
By W. H. Robinson.

(*Communicated by the Radcliffe Observer.*)

Two or three interesting features in connection with the appearance of this Sun-spot during its passage over the Sun's limb may be worthy of being placed upon record.

It will be remembered that the spot was the principal one of a group of unusual dimensions, and attracted considerable attention during its period of visibility from September 3 to 15.

Frequent observations, with sketches, were made at this observatory, using the Barclay equatorial. Two of the sketches are here reproduced.

On September 15, at 1.15 p.m., the spot was observed to be very close indeed to the limb, being only separated from it by a bright, uneven line. A sketch was made, and a remark added as follows: "Preceding edge of spot (on limb) brighter than adjacent photosphere." A good opportunity for seeing the phases of the spot in its transit over the limb being thus afforded, it was decided to make further observations later on, and at 3.45 p.m. the telescope was again turned to the object. But, instead of seeing, as expected, an indentation on the edge of the Sun, the spot was visible as a *projection beyond the limb* (see sketch 2). The observer's remark for this time was: "In intervals of good definition this was seen very distinctly, and looked very like a crater on the Moon's terminator with the illuminated side pre-

1899MNRAS..59..156R

ceding. Might not this phenomenon be an effect of irradiation? (See note made, concerning brightness of preceding edge of spot, at 1.15 p.m.)"

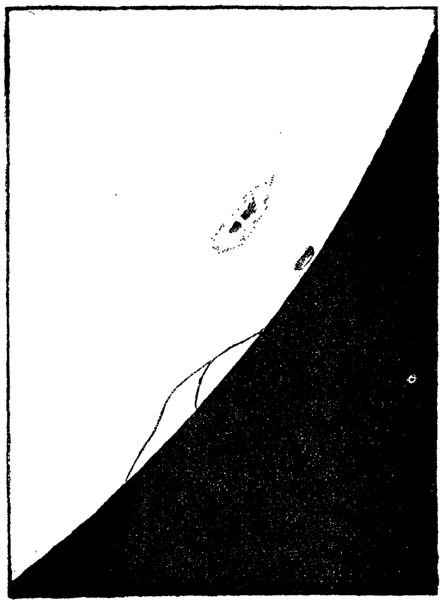

Fig. 1.

1898 Sept. 15, 1.15 p.m. G.M.T.
Sun-spot near limb.

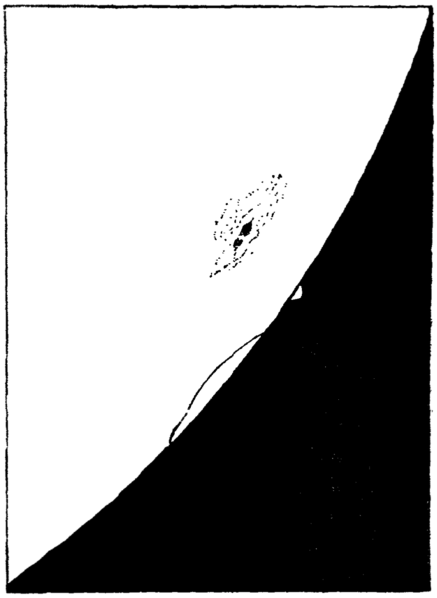

Fig. 2.

1898 Sept. 15, 3.45 p.m. G.M.T.
Showing projection.

[Near the base of the projection a trace of the spot's umbra was occasionally seen just within the solar limb, but this does not appear in fig. 2.]

Observations of faculæ beyond the solar limb are mentioned by Young in his work on "The Sun." He says: "On a few occasions, when a spot of unusual size and depth passes over the limb of the sun, a distinct depression is observed in the outline. . . . Usually, however, the faculæ, which surround the spot, mask this effect entirely, and often actually give us a number of little projecting hillocks in place of the expected depression."

Mr. Maunder, in *The Observatory* for October 1898, states that "the great spot was last seen—as a notch on the west limb—on September 15, and it was then followed only by one spot, the rearward spot of the preceding day." Mr. Newbegin's photographs also show a depression on the limb (*Observatory*, January 1899). The apparent discrepancy between these and the Oxford observations will be explained if the "notch" occurred between 1.15 and 3.45 p.m. At the latter time the projection before described was distinct. It was also intermittently followed until about 5.15 p.m.

The second remarkable feature was that of dark lines which were plainly visible near the limb (see both sketches). At the earlier time, 1.15 p.m., they resembled long furrows with bright edges. The original notes are as follows:—"1.15 p.m. 'Canals' dark, as shown, very distinct, with bright 'banks.'" "3.45 p.m. The longer 'canal' is still visible."

1899MNRAS..59..156R

Mr. Dawes (*Monthly Notices R.A.S.* xx. 56) gives an observation of dark lines seen by him on the solar surface. He says: "During the most tranquil moments I satisfactorily made out an excessively narrow *black* line, a little broken in two or three places, as if by irregularities in the inner bright streak." But Dawes' observation was interrupted by a storm of hail, snow, and sleet.

In conclusion, it may be worth mentioning that the Sun-spot roughly indicated in the sketches, and called in a previous quotation "the rearward spot," also attracted notice here on the afternoon of September 15. In intervals of good seeing it was a beautiful object; the most striking feature being its many concentric, and apparently shelving, penumbræ, presenting some very fine detail.

Radcliffe Observatory, Oxford:
1899 *January* 9.

Note on a Preliminary and Unsuccessful Attempt to Photograph the Corona without an Eclipse. By Rev. C. D. P. Davies, M.A.

Before attempting a spectroscopic plan which I have had in mind with a view to investigate the corona without a total eclipse, it struck me that it might be just worth while to try something much simpler, unpromising though the prospect might be. I have tried it with results which I regard as negative, but which, nevertheless, it may be well to record, if only on the chance of saving others future trouble and disappointment.

In a photograph taken by Mrs. Maunder, after the end of totality in India last January, the whole outline of the Moon was induced to impress its image on the plate in spite of the intrusion of light from the photosphere into the camera. It occurred to me as being just within the bounds of possibility that traces of the corona might be obtained if light direct from the photosphere were prevented from falling on the lens producing the image on the plate. It would thus not enter the camera at all. I am not aware that this has been tried before. It is not quite the same thing as the employment of a screen, bar, or other eclipsing device in an eye-piece.

The following is the arrangement that I adopted: In a wooden tube of square section and four inches internal diameter I placed (*a*) an achromatic object-glass (the "Webster") of two inches diameter and 28-inch focus. In the focus of this, and coincident with the Sun's image, I soldered at the intersection of two fine wires set at right angles to each other (*b*) a brass circular disc of such size as just to cut out the image of the photosphere. The disc and wires supporting it could be rotated so that the image of the wires on the plate might serve as marks of the cardinal points of the Sun's periphery, or of his